

CLAIMS:

1. A method comprising:
receiving a routing communication in accordance with a routing protocol, wherein the routing communication identifies at least one network device that supports performance monitoring of a network; and
sending a performance probe to the network device to collect network performance statistics.
2. The method of claim 1, wherein receiving a routing communication includes receiving a plurality of routing communications that identify network devices that support performance monitoring of a network and further comprising dynamically generating data to identify the network devices that support performance monitoring in response to the communications.
3. The method of claim 1, wherein the routing communication includes an identifier associated with the network device and an indicator that indicates the network device is capable of supporting performance monitoring.
4. The method of claim 1, further comprising:
generating an outbound routing communication in accordance with the routing protocol; and
sending the outbound routing communication to the network device that support performance monitoring via the routing protocol, wherein the outbound routing communication identifies at least the sending network device as a supporter of performance monitoring.
5. The method of claim 1, further comprising generating the performance probe to include a timestamp that indicates a time at which the probe was sent.

6. The method of claim 1, wherein sending the performance probe comprises sending a plurality of performance probes.
7. The method of claim 6, wherein each of the performance probes is addressed to a common destination network device.
8. The method of claim 6, wherein each of the performance probes is associated with the same quality of service level.
9. The method of claim 6, wherein sending the plurality of performance probes comprises sending the plurality of performance probes at a periodic rate over an interval of time.
10. The method of claim 6, wherein sending the plurality of performance probes comprises:
 - sending a first performance probe having a first quality of service level to the network device; and
 - sending a second performance probe having a second quality of service level to the network device.
11. The method of claim 1, further comprising:
 - receiving a response to the performance probe from the network device;
 - adding timestamp to the response to indicate the time of reception of the response;
 - and
 - storing information contained in the response.
12. The method of claim 11, further comprising forwarding the stored information to a centralized computing device for computing comprehensive network performance statistics.
13. The method of claim 11, further comprising:

computing the network performance statistics from the information contained in the response; and

forwarding the network performance statistic to a centralized device for computing comprehensive network performance statistics.

14. The method of claim 1, further comprising:
receiving an inbound performance probe from the network device; and
sending a response to the inbound performance probe to the network device, wherein the response to the performance probe includes the received performance probe and a timestamp indicating the time of reception of the inbound performance probe.

15. The method of claim 1, wherein the network performance statistics includes at least one of network delay, network jitter, network throughput, network availability and network packet loss.

16. The method of claim 1, wherein the routing protocol comprises one of Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), Intermediate System – Intermediate System (ISIS), and Routing Information Protocol (RIP).

17. A network device comprising a routing communication manager that receives a routing communication that indicates that at least one network device supports performance monitoring, wherein in response to the routing communication the routing communication manager generates a data structure that identifies the network device that support performance monitoring.

18. The network device of claim 17, wherein the routing communication manager generates an outbound routing communication in accordance with the routing protocol, and sends the outbound routing communication to the network device identified in the data structure via a routing communication protocol, wherein the outbound routing communication identifies the sending network device as a supporter of performance monitoring.

19. The network device of claim 18, wherein the outbound routing communication includes an identifier associated with the sending network device and an indicator that indicates the sending network device is capable of supporting performance monitoring.
20. The network device of claim 17, further comprising a performance monitoring manager that collects network performance statistics by sending a performance probe to the network device identified in the data structure.
21. The network device of claim 20, wherein the performance monitoring manager generates a performance probe that includes a timestamp and sends the performance probe to the network device identified in the data structure to collect the network performance statistics.
22. The network device of claim 21, wherein the performance monitoring manager sends each of performance probe to a same destination network device.
23. The network device of claim 22, wherein each performance probe is associated with the same quality of service level.
24. The network device of claim 22, wherein the performance monitoring manager sends each performance probe at a periodic rate over an interval of time.
25. The network device of claim 20, wherein the performance monitoring manager sends a first performance probe associated with a first quality of service level to the network device identified in the data structure and a second performance probe associated with a second quality of service level to the network device.
26. The network device of claim 20, wherein the performance monitoring manager receives a response to each of the performance probes, adds a timestamp to each of the

responses to indicate the time of reception of the responses, and stores information contained in the responses.

27. The network device of claim 26, wherein the performance monitoring manager forwards the stored information to a centralized computing device for computing comprehensive network performance statistics.

28. The network device of claim 26, wherein the performance monitoring manager computes the network performance statistics from the information contained in the response and forwards the network performance statistics to a centralized device for computing comprehensive network performance statistics.

29. The network device of claim 20, wherein the performance monitoring manager receives an inbound performance probe from the network device identified in the data structure and sends a response to the inbound performance probe, wherein the response includes the received performance probe and a timestamp indicating the time of reception of the inbound performance probe.

30. The network device of claim 20, further comprising a processor and wherein at least one of the routing communication manager and the performance monitoring manager comprises a software process executing on the processor.

31. The network device of claim 20, wherein at least one of the routing communication manager and the performance monitoring manager are executed in hardware.

32. The network device of claim 20, further comprising a dedicated service card that implements the performance monitoring manager.

33. The network device of claim 17, wherein the network performance statistics include at least one of network delay, network jitter, network throughput, network availability and network packet loss.

34. The network device of claim 17, wherein the routing protocol comprises one of Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), Intermediate System – Intermediate System (ISIS), and Routing Information Protocol (RIP).

35. A system comprising:

network devices that exchange routing communications with one another in accordance with a routing protocol to identify network devices that collect network performance information via performance probes; and

a statistical computing device that aggregates performance information from the network devices and computes collective network performance information for the network devices based on the aggregated performance information.

36. The system of claim 35, wherein the statistical computing device displays the collective network performance statistics to a user.

37. The system of claim 36, wherein the statistical computing device displays the network performance statistics to the user in real-time.

38. The system of claim 35, wherein each of the network devices receive routing communications from other ones of the network devices that support performance monitoring of a network, generate a data structure to identify the network devices that support performance monitoring, and send one or more performance probes to at least one of the network devices identified by the data structure to collect performance information.

39. The system of claim 35, wherein each of the network devices exchange the routing communication via one of Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), and Intermediate System – Intermediate System (ISIS).

40. The system of claim 35, wherein each of the network devices collect performance information by sending performance probes to at least a portion of the set of network devices,

receiving responses to the performance probes, and adding timestamps to the responses to indicate the time of reception of the responses.

41. A network device comprising:

a routing communication manager that exchanges routing communications in accordance with a routing protocol with other network devices to define a community that collects network performance information; and

a performance monitoring service card that manages performance sessions with the network devices of the community.

42. The network device of claim 41, wherein the performance monitoring service card generates performance probes and sends the performance probes to the network devices of the community to collect network performance statistics, wherein each of the performance probes include a timestamp indicating a time at which the respective one of the performance probes was sent.

43. The network device of claim 41, wherein the performance monitoring service card receives a response to the performance probe from the network device, adds a timestamp to the response to indicate the time of reception of the response, and stores information contained in the response.

44. The network device of claim 41, wherein the performance monitoring service card receives an inbound performance probe from the network device and sends a response to the inbound performance probe, wherein the response to the performance probe includes the received performance probe and a timestamp indicating the time of reception of the inbound performance probe.

45. The network device of claim 41, wherein the routing protocol comprises one of Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), and Intermediate System – Intermediate System (ISIS).

46. A computer-readable medium comprising instructions that cause a processor to:
receive a routing communication in accordance with a routing protocol, wherein the routing communication identifies at least one network device that supports performance monitoring of a network; and
send a performance probe to the network device to collect network performance statistics.
47. The computer-readable medium of claim 46, further comprising instruction that cause the processor to:
generate an outbound routing communication in accordance with the routing protocol;
and
send the outbound routing communication to the network device that support performance monitoring via the routing protocol, wherein the outbound routing communication identifies at least the sending network device as a supporter of performance monitoring.
48. The computer-readable medium of claim 46, further comprising instructions that cause the processor to generate the performance probe to include a timestamp that indicates a time at which the probe was sent.
49. The computer-readable medium of claim 46, further comprising instruction that cause the processor to:
receive a response to the performance probe from the network device;
add timestamp to the response to indicate the time of reception of the response; and
store information contained in the response.
50. The computer-readable medium of claim 49, further comprising instruction that cause the processor to further comprising forward the stored information to a centralized computing device for computing comprehensive network performance statistics.

51. The computer-readable medium of claim 46, further comprising instruction that cause the processor to:

receive an inbound performance probe from the network device; and

send a response to the inbound performance probe to the network device, wherein the response to the performance probe includes the received performance probe and a timestamp indicating the time of reception of the inbound performance probe.